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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,266	03/23/2006	Edmund Sergio Robert Sikora	36-1983	3043

23117 7590 09/19/2008

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EXAMINER	
TRAN, DZUNG D	

ART UNIT	PAPER NUMBER
2613	

MAIL DATE	DELIVERY MODE
09/19/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/573,266	SIKORA ET AL.	
	Examiner	Art Unit	
	Dzung D. Tran	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 March 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7, 12-15, 17-36 and 38-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Udd US patent no. 5,223,967.

Regarding claim 1, Udd discloses in Figure 5, a method of communicating between a first location and a second location, the method including the steps of:

at the first location, a laser 74 for generating output signals having an irregular component, and copying the output signals at least in part such that for each output signal, there is a pair of signal copies (i.e., splitter/combiner 68 is splitting signal from laser 74 to a pair of signal copies), the irregular component being common to each of the signal copies of a pair;

transmitting, from the first location, each signal copy of a pair over a common communications link 66;

at the second location 70, mixing data onto the irregular component of a signal copy for at least some of the pairs of signal copies (Figure 6 shown detail of transmitter 70); and

at the first location, an optical detector 90 for receiving signal copies from the second location and, for pairs of received signal copies, combining the respective irregular components of the signal copies of a pair in order to extract therefrom data mixed at the second location.

Regarding claim 2, Udd discloses wherein the source is an optical source, the output signals being optical signals (col. 5, lines 9-10).

Regarding claim 3, Udd discloses wherein the mixing is carried out through the modulation of the irregular component (col. 6, lines 6-14).

Regarding claim 4, Udd discloses wherein the irregular component is random or pseudo random (col. 5, lines 35-66).

Regarding claim 5, Udd discloses the output signal has a waveform, the irregular component being the phase of the waveform, the waveform having randomly occurring phase changes (col. 5, lines 35-66).

Regarding claim 6, Udd discloses wherein the mixing occurs throughout the phase-modulation of the waveform (col. 6, lines 6-14).

Regarding claim 7, Udd discloses in Figure 5 wherein signal copies of a pair are transmitted over the common communications link 66 with a delay relative to one another.

Regarding claims 12-13, Udd discloses wherein the source is configured to produce a continuous signal stream and wherein the output signals have predetermined respective positions in the signal stream (col. 5, lines 8-55).

Regarding claim 14, Udd discloses wherein the signal copies are delayed relative to one another at the first location, and wherein at the second location, signals are mixed according to a burst mode protocol, in which protocol the time between bursts is larger than the duration of the differential delay (col.5, line 56 to col. 6, line 20).

Regarding claim 15, Udd discloses in Figure 5 wherein the signals returned from the second location to the first location are returned along the common communications link.

Regarding claim 17, Udd discloses wherein the signals are modulated at the second location (col. 6, lines 6-14).

Regarding claim 18, Udd discloses detector 90 for monitoring the signals returned from the second location, so as to detect whether a physical disturbance in the communications link occurs. Regarding claims 19-20, Udd discloses wherein the waveform has an average phase-coherence time of less than 10 pico seconds and wherein the phase-coherence time is less than 1 pico second (col. 5, lines 35-48).

Regarding claim 21, Udd discloses in Figure 5 wherein for each pair of out bound signal copies transmitted from the first location to the second location, one copy of delayed such that there is a leading copy and a trailing copy, there being a differential delay between the leading copy and the trailing copy, and, preferably, wherein for each pair of signal copies returned from the second location, the leading copy is delayed at the first location, such that when the two copies are combined, the differential delay is reduced to allow the copies to be combined substantially instep.

Regarding claims 22-23, Udd discloses wherein to combine the signal copies of a pair, the signal copies are caused to interfere and wherein the trailing copy of a signal pair is delayed at the first location by a delay stage, the leading copy of the pair in the return direction being delayed by the same delay stage in order to reduce the differential delay between the two copies (see Figure 5).

Regarding claim 24, Udd discloses in Figure 5, a method of communicating over a data link, the method including the steps of:

a laser 74 for generating output signals having an irregular component;

copying at least in part the output signals such that for each output signal, there is a pair of signal copies, the irregular component being common to each of the signal copies of a pair and transmitting at least one signal copy of each pair onto a common communications link (i.e., splitter/combiner 68 is splitting signal from laser 74 to a pair of signal copies);

a detector 90 for receiving, from a remote location, returned signal copies previously transmitted to the remote location, the irregular component of the returned signal copies having data mixed therewith and, combining the received signal copy of a pair with the other signal copy of that pair, such that, in dependence on the combination of the respective irregular components of two signal copies of a pair, a data signal is generated, which data signal is indicative of data mixed remotely with the returned signal copy.

Regarding claim 25, Udd discloses wherein the delay is varied, preferably randomly or pseudo randomly (col. 5, lines 35-66).

Regarding claim 26, Udd discloses in Figure 5, a method of communicating between a first location and a second location, the method including the steps of-at the first location, copying at least in part output signal received from a source such that for each output signal, there is a pair of signal copies, the irregular component being common to each of the signal copies of a pair (i.e., splitter/combiner 68 is splitting signal from laser 74 to a pair of signal copies) and transmitting, from the first location, each signal copy of a pair over a common communications link, at the second location, a transmitter 70 for applying data onto the irregular component of a signal copy of at least some of the pairs of signal copies; and

at the first location, a detector 90 for receiving signal copies from the second location and, for each pair of signal copies, combining the respective irregular components of the signal copies from that pair in order to extract therefrom data mixed at the second location.

Regarding claim 27, Udd discloses in Figure 5,a method of monitoring a transmission link to detect a physical disturbance in the link, the method including the steps of:

copying at least in part output signals such that for each output signal, there is a pair of signal copies (i.e., splitter/combiner 68 is splitting signal from laser 74 to a pair of signal copies) and transmitting at least one signal copy of each pair onto a common communications link 66;

a detector 90 for receiving, from a remote location, returned signal copies previously transmitted to the remote location, and, combining the received signal copy

of a pair with the other signal copy of that pair, such that, in dependence on the combination of-the two signal copies of a pair, a combination signal is generated; in dependence on at least one characteristic of the combination signal, generating a disturbance alert signal.

Regarding claim 28, Udd discloses wherein for each pair of outbound signal copies transmitted from the first location to the second location, one copy of delayed such that there is a leading copy and a trailing copy, there being a differential delay between the leading copy and the trailing copy, the irregular component having an irregularity on a time scale that is less than the differential delay (see Figure 5).

Regarding claim 29, Udd discloses wherein the ratio of the relative delay and the time scale of the irregularity is at least 10^5, preferably at least 10^7 (col. 5, lines 35-48).

Regarding claims 30-32, Udd discloses wherein the data is applied onto the irregular component such that between periods when data is being applied, there are quiet intervals during which data is not being applied, wherein the duration of the quiet periods is greater than the differential delay and wherein the periods during which data is applied are each shorter than the differential delay (col.5, line 14 to col. 6, line 39).

Regarding claim 33, Udd discloses wherein the first path and the second path have a path difference of at least 1 km, preferably at least 8 km, yet more preferably at least 10 km (col. 5, lines 10-35).

Regarding claim 34, Udd discloses in Figure 5, a communications apparatus having:

a source 74 for generating output signals having an irregular component;

a copying stage for copying at least in part the signals from the source such that for each output signal, there is a pair of signal copies, the irregular component being common to each signal copy of a pair (i.e., splitter/combiner 68 is splitting signal from laser 74 to a pair of signal copies);

a transmission stage for transmitting the signal copies of a pair onto a common communications link 66;

a receiving stage 90 for receiving signal copies returned from a remote location, the irregular component of at least some of the returned signals having data mixed therewith; a combination stage for causing the respective irregular components of the returned signals to combine; and,

data processing means coupled to the combination stage, the data processing means being configured to generate in use a data signal in dependence on a combination of the of the returned signals of a pair, the data signal being representative of data, if any, carried by a returned signal (i.e., detector 90 converts light signal into a amplitude modulated electrical signal that means it process the return data signal, see col. 1, lines 47-58).

Regarding claim 35, Udd discloses wherein a coupling stage (i.e., splitter/combiner 68) is provided which acts on the one hand as the copying stage for signals travelling in an outbound direction towards the common communications line, and on the other hand, as the combination stage for signals travelling in a return direction from the common communications link.

Regarding claim 36, Udd discloses wherein the copying stage (i.e., splitter/combiner 68) and the transmission stage are connected by a first path and a second path, each of the first and second paths extending between the copying stage and the transmission stage, the transit time associated with the first path being greater than the transit time associated with the second path.

Regarding claim 39, Udd discloses wherein the ratio of the differential delay and the coherence time of the source is at least 10^5, preferably at least 10^7 (col. 5, lines 35-48).

Regarding claim 40, Udd discloses in Figure 5, a communication method for performing secure communication, comprising the steps of:

a source 74 for transmitting towards a remote location signals that are time delayed relative to one another and applying data onto at least some of the time delayed signals at the remote location;

a detector 90 for receiving the time delayed signals returned from the remote location and performing a function on the time delayed signals to extract the applied data, wherein the signals have an irregular component, preferably the phase, the irregularity of the component being on a time scale that smaller than the relative time delay.

Regarding claim 41, Udd discloses wherein the ratio of the differential delay and the coherence time of the source is at least 10^5, preferably at least 10^7 (col. 5, lines 35-48).

Regarding claims 42-44, Udd discloses wherein the data is applied at the remote location such that between periods when data is being applied, there are quiet intervals during which data is not being applied, wherein the duration of the quiet intervals is greater than the differential time delay and wherein the periods during which data is applied are each shorter than the differential time delay (col.5, line 14 to col. 6, line 39).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 8-11, 16 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Udd US patent no. 5,223,967 in view of Davis US patent no. 5,473,459.

Regarding claim 8, Udd does not specifically disclose wherein a differential delay being caused at an unbalanced interferometer, the interferometer having a first path and a second path, the transit time of the first path being longer than that of the second path, signal copies of a pair being caused to travel along a different respective path to one another.

Davis discloses in Figure 2, a differential delay being caused at an unbalanced interferometer, the interferometer having a first path 24F and a second path 24S, the transit time of the first path being longer than that of the second path, signal copies of a pair being caused to travel along a different respective path to one another. At the time of the invention was made, it would have been obvious to an artisan to include the unbalanced interferometer taught by Davis in the system of Udd. One of ordinary skill in the art would have motivated to do that in order to reduce the noise signal.

Regarding claims 9-11, Davis discloses wherein the interferometer has a first coupling stage 22 which is coupled to the source, the coupling stage being arranged to channel one portion of the incoming radiation intensity from the source along one path, and another portion of the incoming radiation intensity along the other path, so as to form the first and second signal copies and wherein the interferometer has a second coupling stage 28 for combining radiation from the first and second paths, and for coupling the combined radiation to the common communications link 39 (see Figure 2).

Regarding claim 16, Davis discloses wherein signals are reflected by reflector means 34 at the second location in order to return the signals to the first location.

Regarding claim 37, Davis discloses wherein the paths are formed by an unbalanced interferometer, preferably an unbalanced Mach Zhender interferometer (col. 5, lines 52-64).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Podoleanu et al. U.S. Patent no. 5,975,697. Optical mapping apparatus with adjustable depth resolution

b. Sasayama et al. U.S. Patent no. 4,708,480. Solid-state optical interferometer

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung D Tran whose telephone number is (571) 272-3025. The examiner can normally be reached on 9:00 AM - 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from thePatent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.
Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dzung Tran

09/12/2008

/Dzung D Tran/

Primary Examiner, Art Unit 2613